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EXAMINER

GODBOLD, DOUGLAS

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

DETAILED ACTION

1. This Office Action is in response to correspondence filed September 14, 2009 in reference to application 10/733,995. Claims 1-16 are pending and have been examined.

Response to Amendment

2. The amendment filed September 14, 2009 has been accepted and considered in this office action. Claims 1-16 have been amended and claim 17 has been cancelled.

Response to Arguments

3. Applicant's arguments filed September 14, 2009 have been fully considered but they are not persuasive.

4. Regarding applicant's arguments, see Remarks pages 12-14, that Mahajan, Guerra, and Shao do not teach determining whether to modify the current grammar based at least in part on the at least one measure, the examiner agrees. However, the examiner believes that Yuschik, previously of record teaches these limitations as laid out in the rejection below.

5. Regarding applicant's arguments, see Remarks page 15, that Mahajan does not teach an "analysis interface," the examiner respectfully disagrees. Mahajan uses a test grammar to decode test inputs; see column 5 lines 11-36. Therefore there must be

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some interface to load the grammars and accept the utterance from the user. Otherwise the system disclosed in Mahajan would not operate. Even assuming, *arguendo*, that Mahajan does not teach an analysis interface, the examiner believes that Yuschik also teaches these limitations. Figure 3, step 320, column 11 lines 34-57, vocabulary words are collected for testing. Therefore an "analysis interface" is at least suggested by the prior art of record.

Claim Rejections - 35 USC § 103

6. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
7. Claims 1-4 and 7-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mahajan et al. (US Patent 7,117,153) in view of Guerra (US PAP 2002/0188,451), in view of Shao, (US Patent 7,117,153) and further in view of Yuschik (US Patent 7,139,706).
8. Consider claim 1, Mahajan teaches a method of evaluating grammars associated with a voice system (figure 2, shows a method for evaluating recognition in a voice system such as figure 1, connected to Wide area Network 173, that could be used to access data.), said method comprising:

generating a test input for a current grammar of the voice system, the test input including a test pattern (At step 202, a portion of training data 304 is spoken by a person 308 to generate a test signal, in order to test the recognition models; Column 5 line 11.);

providing the test input to the voice system on the voice system server using a voice server (voice recognition system software) (The acoustic signal is converted into waveforms by receiver 309 and feature extractor 310, and the feature vectors are provided to a decoder 312; column 5 lines 13-15.);

receiving at least one measure of quality of recognition for the current grammar (Under one embodiment, this objective function is an error function that indicates the degree to which the predicted sequence of speech units differs from the actual sequence of speech units after the alignment is complete; column 5, lines 44-47.) the current grammar being one grammar of the set of active grammars (At step 204, the predicted sequence of speech units is aligned with the actual sequence of speech units from training data 304; column 5. line 37. The current grammar is the word currently being tested).

But Mahajan does not specifically teach that the voice system is a voice portal.

In the same field of speech systems, Guerra teaches that the voice system is a voice portal (voice portal system, figure 4 and abstract.)

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention for a voice portal to be the voice system being tested and developed as taught by Guerra with the testing system of Mahajan in order to facilitate the desired feature of Guerra on the fly grammar updates (Guerra 0108).

Mahajan and Guerra do not specifically teach deriving a measure of how distinguishable the current grammar is from other grammars of the set of active grammars based at least in part on the analysis of the test pattern.

In the same field of speech recognition, Shao teaches deriving a measure of how distinguishable the current grammar is from other grammars of the set of active grammars based at least in part on the analysis of the test pattern (Figure 4, paragraph 0046, ambiguity ratio determine how distinguishable best fit is from second best fit).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the art to use an ambiguity ratio as taught by Shao in the system of Mahajan and Guerra in order to help determine if the grammar has been successfully recognized.

Mahajan, Guerra, and Shao does not specifically teach determining whether to modify the current grammar based at least in part on the at least one measure.

In the same field of grammar modification, Yuschik teaches determining whether to modify the current grammar based at least in part on the at least one measure.

(figure 3, step 340 does an acoustic analysis to determine similarity in order to reduce recognition error, step 350 selects alternative words if necessary, thereby providing a less confusable alternative to the words available to be recognized; column 11 line 34- column 13 line 3).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to use the grammar modification as taught by Yuschik with the system of Mahajan and Guerra and Shao in order to facilitate the desired recognition grammar updating contemplated in Yuschik 0100-0108.

9. Consider claim 2, Shao teaches the method of claim 1, wherein deriving a measure of how distinguishable the current grammar is from other grammars of the set of active grammars includes deriving a confidence level and a set of n-best results for the test input (paragraph 0046, best match in compared with 2nd best, which is n-best, where n=2), and wherein the method further comprises comparing the confidence level and set of n-best results for the test input with an expected value to assess the measure of how distinguishable the current grammar is from other grammars of the set of active grammars (paragraph 0046, best match score and ambiguity ratio).

10. Consider claim 3, Mahajan, Guerra, and Shao does not specifically teach modifying the current grammar to create a modified grammar if the at least one measure indicates that the current grammar is not sufficiently distinguishable

In the same field of grammar modification, Yuschik teaches modifying the current grammar to create a grammar if the at least one measure indicates that the current grammar is not sufficiently distinguishable (figure 3, step 340 does an acoustic analysis to determine similarity in order to reduce recognition error, step 350 selects alternative words if necessary, thereby providing a less confusable alternative to the words available to be recognized; column 11 line 34- column 13 line 3).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to use the grammar modification as taught by Yuschik with the system

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of Mahajan and Guerra and Shao in order to facilitate the desired recognition grammar updating contemplated in Yuschik 0100-0108.

11. Consider claim 4, Mahajan and Guerra and Shao suggests the method of claim 3, further comprising the steps of:

(i) generating a test input for the modified grammar, the test input including a test pattern for the grammar (Mahajan At step 202, a portion of training data 304 is spoken by a person 308 to generate a test signal, in order to test the recognition models; Column 5 line 11.);

(ii) providing the test input for the modified grammar to the voice portal () (Mahajan, the acoustic signal is converted into waveforms by receiver 309 and feature extractor 310, and the feature vectors are provided to a decoder 312; column 5 lines 13-15.);

(iii) receiving at least one measure how distinguishable the modified grammar is from other grammars of the set of active grammars that are active when the modified grammar is active (Shao, Figure 4, paragraph 0046, ambiguity ratio determine how distinguishable best fit is from second best fit, it would have been obvious to one of ordinary skill in the art at the time of the art to use an ambiguity ratio as taught by Shao in the system of Mahajan and Guerra in order to help determine if the grammar has been successfully recognized), the current grammar being one grammar of the set of active grammars (Mahajan, At step 204, the predicted sequence of speech units is aligned

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with the actual sequence of speech units from training data 304; column 5. line 37. The current grammar is the word currently being tested). ; and

Mahajan and Guerra and Shao do not suggest that these steps are complete on modified grammar, and

(iv) re-modifying the modified grammar and repeating steps (i) through (iv) until the measure of quality of recognition of the modified grammar does not deviate from a pre-determined range.

In the same field of updating grammars, Yuschik suggests that these steps are complete on modified grammar, and

(iv) re-modifying the modified grammar and repeating steps (i) through (iii) until the measure of how distinguishable the modified grammar is from other grammars of the set of active grammars that are active when the modified grammar indicates that the modified grammar is sufficiently distinguishable from the other grammars of the set of active grammars that are active when the modified grammar is active. (This is merely reanalyzing the output of the recognizer after the grammar has been updated. Figure 3 of Yuschik shows that the acoustical analysis of 340 is repeated until the acoustical difference is great enough to allow for accurate speech recognition.)

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to use this step of repeated analysis as taught by Yuschik in the system of Mahajan and Guerra and Shao as it would be useful to determine the recognizably of any alternative words entered into the grammar by the modifying step, thereby insuring that the change increased the performance of the recognizer.

12. Consider claim 7, Mahajan teaches a computer readable storage medium encoded with instructions (figure 1 shows memories 141, 151, 152, 155, and 156 capable of storing the computer code) which, when executed by a computer cause the computer to perform a method of evaluating grammars associated with a voice system (figure 2, shows a method for evaluating recognition in a voice system such as figure 1, connected to Wide area Network 173, that could be used to access data) , the method comprising:

generating a test input for a current grammar of the voice system, the test input including a test pattern (At step 202, a portion of training data 304 is spoken by a person 308 to generate a test signal; Column 5 line 11.);

generating a test input for a current grammar of the voice system, the test input including a test pattern (At step 202, a portion of training data 304 is spoken by a person 308 to generate a test signal, in order to test the recognition models; Column 5 line 11.);

providing the test input to the voice system on the voice system server using a voice server (voice recognition system software) (The acoustic signal is converted into waveforms by receiver 309 and feature extractor 310, and the feature vectors are provided to a decoder 312; column 5 lines 13-15.);

receiving at least one measure of quality of recognition for the current grammar (Under one embodiment, this objective function is an error function that indicates the degree to which the predicted sequence of speech units differs from the actual sequence of speech units after the alignment is complete; column 5, lines 44-47.) the

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current grammar being one grammar of the set of active grammars (At step 204, the predicted sequence of speech units is aligned with the actual sequence of speech units from training data 304; column 5. line 37. The current grammar is the word currently being tested).

But Mahajan does not specifically teach that the voice system is a voice portal.

In the same field of speech systems, Guerra teaches that the voice system is a voice portal (voice portal system, figure 4 and abstract.)

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention for a voice portal to be the voice system being tested and developed as taught by Guerra with the testing system of Mahajan in order to facilitate the desired feature of Guerra on the fly grammar updates (Guerra 0108).

Mahajan and Guerra do not specifically teach deriving a measure of how distinguishable the current grammar is from other grammars of the set of active grammars based at least in part on the analysis of the test pattern.

In the same field of speech recognition, Shao teaches deriving a measure of how distinguishable the current grammar is from other grammars of the set of active grammars based at least in part on the analysis of the test pattern (Figure 4, paragraph 0046, ambiguity ratio determine how distinguishable best fit is from second best fit).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the art to use an ambiguity ratio as taught by Shao in the system of Mahajan and Guerra in order to help determine if the grammar has be successfully recognized.

Mahajan, Guerra, and Shao does not specifically teach determining whether to modify the current grammar based at least in part on the at least one measure.

In the same field of grammar modification, Yuschik teaches determining whether to modify the current grammar based at least in part on the at least one measure.

(figure 3, step 340 does an acoustic analysis to determine similarity in order to reduce recognition error, step 350 selects alternative words if necessary, thereby providing a less confusable alternative to the words available to be recognized; column 11 line 34- column 13 line 3).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to use the grammar modification as taught by Yuschik with the system of Mahajan and Guerra and Shao in order to facilitate the desired recognition grammar updating contemplated in Yuschik 0100-0108.

13. Claim 8 is directed towards a computer readable storage medium designed to execute a method similar to the method of claim 3 and is therefore rejected for similar reasons.

14. Claim 9 is directed towards a computer readable storage medium designed to execute a method similar to the method of claim 3 and is therefore rejected for similar reasons.

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15. Claim 10 is directed towards a computer readable storage medium designed to execute a method similar to the method of claim 4 and is therefore rejected for similar reasons.

16. Claims 5, 6, and 11-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mahajan in view of Guerra and Shao and Yuschik as applied to claims 1 and 7 above and further in view of Randic (US Patent 6,275,797).

17. Consider claim 5, Mahajan and Guerra and Shao teaches the method of claim 1, but does not specifically teach modifying the test pattern to emulate one or more user voices prior to entering the test input into the voice portal.

In the same field of speech testing, Randic suggests modifying the test pattern to emulate one or more user voices prior to providing the test input to the voice portal (Figure 1 shows using a voice test file generated by a TTS engine used to test the voice path using recognition. This is a similar technique used to test the quality of recognition in Mahajan. Using a computer generated voice to generate the test file, Column 3 line 27, would inherently allow the test pattern to emulate whatever voice the computer generation system was configured to produce. Further, it is well known in the art that TTS engines can be configured to allow for the generation of multiple voice types, although the claim language suggest that just one voice could be used.).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to use the computerized speech generation as taught by Randic in

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place of the human speaker as taught by Mahajan and Guerra and Shao in order to allow the speech recognizer to become more flexible through the quality analysis.

18. Consider claim 6, Mahajan and Guerra and Shao teaches the method of claim 1, but does not specifically teach modifying the test pattern to emulate the influence of one or more communications network qualities prior to providing the test input into the voice portal.

In the same field of speech testing, Randic teaches modifying the test pattern to emulate the influence of one or more communications network qualities prior to entering the test input into the voice portal (figure 3 shows passing the voiced speech pattern through a transmission scheme in order to evaluate the effect that the voice channel has on recognition; column 4, line 31- column 7 line 29.).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the analysis of the voice channel as taught by Randic with the speech recognition quality evaluation of Mahajan and Guerra and Shao in order to make the speech recognizer more robust.

19. Claim 11 is directed towards a computer readable storage medium designed to execute a method similar to the method of claim 5 and is therefore rejected for similar reasons.

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20. Claim 12 is directed towards a computer readable storage medium designed to execute a method similar to the method of claim 6 and is therefore rejected for similar reasons.

21. Consider claim 13, Mahajan teaches a system for evaluating grammars of a voice system having a speech recognition engine (figure 3), comprising:

an analysis interface for extracting a set of current grammars from a set of active grammars of the voice portal, the current grammar being one grammar of the set of active grammars (training text is selected to be spoken 304, Figure 3, Column 5 line 11. Mahajan uses a test grammar to decode test inputs; see column 5 lines 11-36.

Therefore there must be some interface to load the grammars and accept the utterance from the user. Otherwise the system disclosed in Mahajan would not operate.);

a test pattern generator for generating a test input for the current grammar of the voice portal, the test input including a test pattern (At step 202, a portion of training data 304 is spoken by a person 308 to generate a test signal; Column 5 line 11.); ;

an apparatus for entering each test pattern into the voice system (At step 202, a portion of training data 304 is spoken by a person 308 to generate a test signal; Column 5 line 11.);

a results collector for analyzing the test input entered into the voice system against the set of active grammars (At step 204, the predicted sequence of speech units is aligned with the actual sequence of speech units from training data 304; column 5. line 37.); and

a results analyzer for deriving a set of statistics of a quality of recognition of each current grammar (Under one embodiment, this objective function is an error function that indicates the degree to which the predicted sequence of speech units differs from the actual sequence of speech units after the alignment is complete; column 5, lines 44-47.).

But Mahajan does not specifically teach that the voice system is a voice portal.

In the same field of speech systems, Guerra teaches that the voice system is a voice portal (voice portal system, figure 4 and abstract.)

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention for a voice portal to be the voice system being tested and developed as taught by Guerra with the testing system of Mahajan in order to facilitate the desired feature of Guerra on the fly grammar updates (Guerra 0108).

Mahajan and Guerra do not specifically teach deriving a measure of how distinguishable the current grammar is from other grammars of the set of active grammars based at least in part on the analysis of the test pattern.

In the same field of speech recognition, Shao teaches deriving a measure of how distinguishable the current grammar is from other grammars of the set of active grammars based at least in part on the analysis of the test pattern (Figure 4, paragraph 0046, ambiguity ratio determine how distinguishable best fit is from second best fit).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the art to use an ambiguity ratio as taught by Shao in the system of Mahajan and Guerra in order to help determine if the grammar has been successfully recognized.

But Mahajan and Guerra and Shao do not teach specifically using a text to speech engine to enter data into the voice porthole.

In the same field of speech signal testing, Randic teaches using a text to speech engine to generate test signals for a system (Figure 1 shows using a voice test file generated by a TTS engine used to test the voice path using recognition. This is a similar technique used to test the quality of recognition in Mahajan. Using a computer generated voice to generate the test file, Column 3 line 27, would inherently allow the test pattern to emulate whatever voice the computer generation system was configured to produce.).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to use the computerized speech generation as taught by Randic in place of the human speaker as taught by Mahajan and Guerra and Shao in order to allow for more efficient and more comprehensive quality analysis of the recognizer.

22. Claim 14 is directed towards a system similar to the method of claim 2 and is therefore rejected for similar reasons.

23. Consider claim 15, Mahajan and Guerra in view of Randic teaches the system of claim 13, but does not specifically teach modifying the test pattern to emulate one or more user voices prior to entering the test input into the voice portal.

However Randic teaches modifying the test pattern to emulate one or more user voices prior to entering the test input into the voice portal (Figure 1 shows using a voice

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test file generated by a TTS engine used to test the voice path using recognition. This is a similar technique used to test the quality of recognition in Mahajan. Using a computer generated voice to generate the test file, Column 3 line 27, would inherently allow the test pattern to emulate whatever voice the computer generation system was configured to produce. Further, it is well known in the art that TTS engines can be configured to allow for the generation of multiple voice types, although the claim language suggest that just one voice could be used.).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to use the computerized speech generation as taught by Randic to emulate a user voice in order to allow for more efficient and more accurate quality analysis of the recognizer.

24. Consider claim 16, Mahajan teaches the system of claim 13, wherein the test pattern generator is modified to emulate the influence of one or more communications network qualities prior to entering the test input into the voice portal. (figure 3 shows passing the voiced speech pattern through a transmission scheme in order to evaluate the effect that the voice channel has on recognition; column 4, line 31- column 7 line 29.).

Conclusion

25. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

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§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DOUGLAS C. GODBOLD whose telephone number is (571)270-1451. The examiner can normally be reached on Monday-Thursday 7:00am-4:30pm Friday 7:00am-3:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richemond Dorvil can be reached on (571) 272-7602. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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DCG

/Richemond Dorvil/
Supervisory Patent Examiner, Art Unit 2626